

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or Agent's file reference	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/50785	International filing date (day/month/year) 03.11.2003	Priority date (day/month/year) 05.11.2002
International Patent Classification (IPC) or national classification and IPC G01C19/56		
Applicant THALES et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets including this title page.
  - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Instruction 607 of Administrative Instructions of the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the report
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement according to Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand 22.04.2004	Date of completion of this report 25.08.2004
<b>Name and mailing address of the IPEA</b>   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0, Tx: 523656 epmu d Fax: +49 89 2399 - 4465	<b>Authorized officer:</b>  Springer, O  Telephone No. +49 89 2399-2619  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/50785

**I. Basis of the report**

1. This report has been drawn up on the basis of the following elements *(the replacement sheets received by the receiving office in response to an invitation according to Article 14 are considered in the present report as "originally filed" and are not annexed to the report as they contain no amendments (Rules 70.16 and 70.17).):*

**Description, pages:**

1-17 as originally filed

**Claims, No.:**

1-11 as originally filed

**Drawings, sheets:**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/50785

5. ☐ This report has been written disregarding (some of) the amendments, which were considered as going beyond the description of the invention, as filed, as is indicated below (Rule 70.2(c)):

*(All replacement sheets comprising amendments of this nature should be indicated in point 1 and attached to this report).*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty	Yes:	Claims	1 to 11
	No:	Claims	
Inventive Step	Yes:	Claims	1 to 11
	No:	Claims	
Industrial Applicability	Yes:	Claims	1 to 11
	No:	Claims	

2. Citations and explanations

**see separate sheet**

**As regards Point V:** Reasoned statement under Article 35(2) as regards novelty, inventive step and industrial applicability; citations and explanations in support of this statement.

1. **Technical field:**  
Gyroscope with a vibrating structure.

2. **Prior art:**  
Reference is made to the following documents:

D1: US-A-5 728 936; LUTZ MARKUS; March 17, 1998  
D2: US-A-5 604 312; LUTZ MARKUS; February 18, 1997  
D3: WO-A-02/066929; ROBERT BOSCH GmbH, August 29, 2002  
D4: US-A-6 009 751; BO HANS GUNNAR LJUNG; January 4, 2000  
D5: DE-A-44 28 405; FORSCHUNGSDZENTRUM KARLSRUHE; February 15, 1996

Documents D1, D2 and D3 describe a micromachined gyroscope having a vibrating structure with two moving assemblies coupled by a coupling structure. Each of the two moving assemblies consists of a moving assembly with a vibrating first moving element and a second moving element for detection. Documents D4 and D5 describe a micromachined gyroscope of vibrating structure comprising a moving assembly with a vibrating first moving element, a second moving element for detection and an outer frame.

3. **Independent claims:**  
Claim 1 (device).

4. **Novelty and inventive step - Articles 33(2) and (3) PCT:**  
The present application differs from the device known from documents D1 to D3 in that the first moving element (for excitation) is a rectangular intermediate frame surrounding the second moving element (for detection) and that the coupling structure comprises two outer frames, each of which surrounds the intermediate frame of a respective moving assembly. Such a structure of a moving assembly is not known, nor suggested in the cited prior art. For this reason, the subject matter of claim 1 is considered as novel and inventive.

Claims 2 to 11 depend on claim 1 and therefore themselves also meet the conditions required by the PCT as regards novelty and inventive step.

5. **Industrial applicability - Article 33(4) PCT:**  
The invention claimed in claims 1 to 11 is applicable in the technical field of gyroscopes having a vibrating structure.

6. **Comments:**  
Contrary to what Rule 5.1 a) ii) PCT requires, the description does not indicate the relevant prior art presented in documents D1, D2 and D4, nor does it cite these documents.

[Finisher: please insert the following text to the standard PCT Form 409]

**As regards Point V:**

Reasoned statement under Article 35(2) as regards novelty, inventive step and industrial applicability; citations and explanations in support of this statement.

**1. Technical field:**

Gyroscope with a vibrating structure.

**2. Prior art:**

Reference is made to the following documents:

- D1: US-A-5 728 936: LUTZ MARKUS; March 17, 1998
- D2: US-A-5 604 312; LUTZ MARKUS; February 18, 1997
- D3: WO-A-02/066929; ROBERT BOSCH GmbH, August 29, 2002
- D4: US-A-6 009 751; BO HANS GUNNAR LJUNG; January 4, 2000
- D5: DE-A-44 28 405; FORSCHUNGSDZENTRUM KARLSRUHE; February 15, 1996

Documents D1, D2 and D3 describe a micromachined gyroscope having a vibrating structure with two moving assemblies coupled by a coupling structure. Each of the two moving assemblies consists of a moving assembly with a vibrating first moving element and a second moving element for detection. Documents D4 and D5 describe a micromachined gyroscope of vibrating structure comprising a moving assembly with a vibrating first moving element, a second moving element for detection and an outer frame.

3. **Independent claims:**

Claim 1 (device).

4. **Novelty and inventive step - Articles 33(2) and (3) PCT:**

The present application differs from the device known from documents D1 to D3 in that the first moving element (for excitation) is a rectangular intermediate frame surrounding the second moving element (for detection) and that the coupling structure comprises two outer frames, each of which surrounds the intermediate frame of a respective moving assembly. Such a structure of a moving assembly is not known, nor suggested in the cited prior art. For this reason, the subject matter of claim 1 is considered as novel and inventive.

Claims 2 to 11 depend on claim 1 and therefore themselves also meet the conditions required by the PCT as regards novelty and inventive step.

5. **Industrial applicability - Article 33(4) PCT:**

The invention claimed in claims 1 to 11 is applicable in the technical field of gyroscopes having a vibrating structure.

6. **Comments:**

Contrary to what Rule 5.1 a) ii) PCT requires, the description does not indicate the relevant prior art presented in documents D1, D2 and D4, nor does it cite these documents.

Translation

PATENT COOPERATION TREATY

PCT/EP2003/050785



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 62902	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2003/050785	International filing date (day/month/year) 03 novembre 2003 (03.11.2003)	Priority date (day/month/year) 05 novembre 2002 (05.11.2002)
International Patent Classification (IPC) or national classification and IPC G01C 19/56		
Applicant THALES et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 22 avril 2004 (22.04.2004)	Date of completion of this report 25 August 2004 (25.08.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2003/050785

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is language of a translation furnished for the purpose of:

- ☐ international search (under Rules 12.3 and 23.1(b))  
☐ publication of the international application (under Rule 12.4)  
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ The international application as originally filed/furnished

☒ the description:

pages \_\_\_\_\_ 1-17 \_\_\_\_\_, as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☒ the claims:

pages \_\_\_\_\_ 1-11 \_\_\_\_\_, as originally filed/furnished

pages\* \_\_\_\_\_, as amended (together with any statement) under Article 19

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☒ the drawings:

pages \_\_\_\_\_ 1/3-3/3 \_\_\_\_\_, as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_  
☐ the claims, Nos. \_\_\_\_\_  
☐ the drawings, sheets/figs \_\_\_\_\_  
☐ the sequence listing (*specify*): \_\_\_\_\_  
☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_  
☐ the claims, Nos. \_\_\_\_\_  
☐ the drawings, sheets/figs \_\_\_\_\_  
☐ the sequence listing (*specify*): \_\_\_\_\_  
☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."



**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	1-11	YES
	Claims		NO
Inventive step (IS)	Claims	1-11	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO

**2. Citations and explanations****1. Technical field:**

Rate gyro with a vibrating structure.

**2. Prior art:**

This report makes reference to the following documents:

- D1: US-A-5 728 936; LUTZ MARKUS, 17 March 1998  
D2: US-A-5 604 312; LUTZ MARKUS; 18 February 1997  
D3: WO-A-02/066929; ROBERT BOSCH GMBH; 29 August 2002  
D4: US-A-6 009 751; BO HANS GUNNAR LJUNG; 4 January 2000  
D5: DE-A-44 28 405; FORSCHUNGSZENTRUM KARLSRUHE; 15 February 1996

Documents D1, D2 and D3 describe a micro-machining rate gyro having a vibrating structure with two movable assemblies coupled by a coupling structure. Each of the two movable assemblies comprises a movable assembly with a first vibrating movable element and a second movable element for detecting. Documents D4 and D5 describe a micro-machining rate gyro having a vibrating structure with a movable

assembly having a first vibrating movable element, a second movable element for detecting and an outer frame.

**3. Independent claims:**

Claim 1 (device).

**4. Novelty and inventive step - PCT Articles 33(2) and 33(3):**

The present application differs from the device known from documents D1-D3 in that the first movable element (for exciting) is a rectangular intermediate frame that surrounds the second movable element (for detecting) and in that the coupling structure has two outer frames, each of the outer frames surrounding the intermediate frame of a respective movable assembly. The cited prior art documents neither disclose nor suggest this type of structure for a movable assembly. For this reason, the subject matter of claim 1 is considered novel and inventive.

Claims 2-11 are dependent on claim 1 and therefore also meet the PCT novelty and inventive step requirements.

**5. Industrial applicability - PCT Article 33(4):**

The invention claimed in claims 1-11 is applicable in the technical field of rate gyros having a vibrating structure.

**6. Observations:**

Contrary to PCT Rule 5.1(a)(ii), the description does not cite documents D1, D2 and D4 or indicate the relevant prior art disclosed therein.